

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of: : Examiner: H. Ho
: :
Franz LAERMER et al. :
: :
For: LAYER SYSTEM HAVING A SILICON :
LAYER AND A PASSIVATION LAYER, :
METHOD FOR CREATING :
A PASSIVATION LAYER ON :
A SILICON LAYER AND ITS USE :
: Art Unit: 2818
Filed: August 11, 2005 :
: :
Serial No.: 10/524,610 :
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P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

SIR:

On April 8, 2008, Appellants filed a Notice of Appeal from the last decision of the Examiner contained in the Final Office Action dated October 9, 2007 in the above-identified patent application.

In accordance with 37 C.F.R. § 41.37, this brief is submitted in support of the appeal of the rejections of claims 16 to 28. For at least the reasons set forth below, the final rejections of claims 16 to 28 should be reversed.

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is ROBERT BOSCH GMBH of Stuttgart in the Federal Republic of Germany, which is the assignee of the entire right, title and interest in and to the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, “which may be related to, directly affect or be directly affected by or have a bearing on the Board’s decision in the pending appeal.”

3. STATUS OF CLAIMS

Claims 1 to 15 and 29 to 32 have been canceled.

Claims 16 to 28 are pending.

Claims 16 to 20, 23, and 24 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,604,380 (“Nishimura et al.”).

Claims 21, 22, and 25 to 28 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Nishimura et al.

A copy of the appealed claims, *i.e.*, claims 16 to 28, is attached hereto in the Claims Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action dated October 9, 2007, Appellants submitted a “Reply Under 37 C.F.R. § 1.116” on February 11, 2008. The Reply Under 37 C.F.R. § 1.116 did not include any proposed amendments to the claims. It is Appellants’ understanding that the claims as included in the annexed “Claims Appendix” reflects the current claims.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 16 relates to a layer system. Claim 16 recites that the layer system includes an etching layer, where the etching layer is a silicon layer 11. *Specification* at page 9, lines 21 to 24. Claim 16 recites that the layer system includes a passivation layer 17 applied at least regionally to a surface of the silicon layer 11. *Specification* at page 8, lines 2 to 4. Claim 16 recites that the passivation layer 17 includes a first, at least largely, inorganic partial layer 14 and a second partial layer 15. *Specification* at page 9, lines 21 to 24 and page 10, lines 10 to 13. Claim 16 recites that the second partial layer 15 is made of an organic compound. *Specification* at page 10, line 15 to page 11, line 1.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A. Whether claims 16 to 20, 23, and 24 are anticipated under 35 U.S.C. § 102(b) by Nishimura et al.
- B. Whether claims 21, 22, and 25 to 28 are patentable under 35 U.S.C. § 103(a) over Nishimura et al.

7. ARGUMENT

A. Rejection of Claims 16 to 20, 23, and 24 Under 35 U.S.C. § 102(b)

Claims 16 to 20, 23, and 24 stand rejected under 35 U.S.C. § 102(b) as anticipated by Nishimura et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Independent claim 16 relates to a layer system. Claim 16 recites that the layer system includes an etching layer, where the etching layer is a silicon layer. Claim 16 recites that the layer system includes *a passivation layer applied at least regionally to a surface of the silicon layer*. Claim 16 recites that the passivation layer includes a first, at least largely, inorganic partial layer and a second partial layer. Claim 16 recites that the second partial layer is made of an organic compound.

Nishimura et al. relates to a semiconductor device having a multilayer interconnection structure and disclose, referring to Figure 2(d), a silicon semiconductor substrate 1, an insulating film 2 formed on the substrate 1, a wiring layer 3 formed on the insulating film 2, a silicon oxide film 4 covering the wiring layer 3, a resin film 5 formed on the silicon oxide film 4, a silicon oxide film 6 formed on the resin film 5, and a second wiring layer 7 formed on the silicon oxide film 6. *See col. 9, lines 54 to 64.* In formulating the present rejection, the Office Action contends at page 3, referring to Nishimura et al., that the substrate 1 is an etching layer and the resin film 5 and the silicon oxide film 4 and/or the silicon oxide film 6 constitute a passivation layer. The Advisory Action maintains this position.

It is initially noted that components 4, 5, and/or 6 do not constitute a passivation layer. In this regard, there is no disclosure or suggestion whatsoever within Nishimura et al. that any of components 4, 5, and 6 are passivation layers. In response, the Advisory Action merely points to M.P.E.P. § 2112.01(I) and alleges that “[Appellants] failed to furnish credible evidences to establish such assertion [that elements 4, 5, and 6 do not constitute a passivation layer].” In this regard, the Examiner must present “a sound basis for believing that the products of applicant and the prior art are the same” prior to any burden-

shifting. See, e.g., *In re Spada*, 911 F.2d 705, 709, 15 U.S.P.Q.2d 1655, 1658 (Fed. Cir. 1990). No Office Action to date has established a sound basis for contending that the elements 4, 5, and/or 6 are even capable of being formed by passivation within the specific arrangement (e.g., Figures 2(a) to 2(d)) disclosed by Nishimura et al. Accordingly, the Office's attempt to shift the burden of proof to Appellants is improper.

Notwithstanding the foregoing, the substrate 1, relied upon by the Examiner as purportedly disclosing an etching layer, is separated from the resin film 5 and the silicon oxide films 4 and/or 6 by the insulating film 2. As such, these components 4, 5, and 6 are not applied at least regionally to a surface of a silicon etching layer, as recited in claim 16.

The Advisory Action appears to attempt to rebut this argument by alleging that, in claim 23 of the present application, Appellants “explicitly distinguishes the physical contacting location of the passivation layer, specifically the first partial layer.” The Advisory Action action then concludes, “Therefore claim 1 does not establish the passivation layer must be directly applied to a surface of the etching layer, i.e., silicon layer.”

Claim 23 recites, “The layer system as recited in Claim 16, wherein the first partial layer is directly applied one of (a) to the silicon layer and (b) on a layer of silicon oxide situated on the silicon layer.” In this regard, having the first partial layer directly applied to a layer of silicon oxide situated on the silicon layer does not in any way preclude the passivation layer from being applied directly to the silicon layer, as the Advisory Action appears to suggest. Indeed, claim 16 recites that the passivation layer, of which the first partial layer is only one part, is “applied at least regionally to the silicon layer” (emphasis added).

Further, substrate 1 is not an etching layer. Contrary to the assertion at page 3 of the Final Office Action, the language of claim 16 does not support the apparent interpretation by the Examiner that any silicon layer is an etching layer. In this regard, claim 16 does not simply recite a silicon layer, but recites an layer that is an etching layer and a silicon layer. Referring to the figures of Nishimura et al., the substrate 1 is entirely covered and separated from any etching by at least insulation layer 2. It is respectfully submitted that under no reasonable interpretation could the substrate 1 be considered an etching layer within the meaning of the present claims. It is noted in this regard that Nishimura et al. was previously cited as the sole reference in the rejection of all of the pending claims in the Office Action dated December 22, 2006. In response to this rejection, Appellants, in the “Amendment” submitted on March 22, 2007, amended the claims into their present form by including a single amendment to claim 16 to recite --an etching layer, whereby the etching

layer is a silicon layer--, and argued at page 5 that Nishimura et al. does not disclose or suggest an etching layer as recited in claim 16. In response, the Examiner admitted at that these arguments -- made with respect to the claims in their present form -- were persuasive. See Final Office Action dated June 15, 2007, page 2 (“Applicant’s arguments, see pgs. 4 – 5 [of the “Amendment” submitted on March 22, 2007], with respect to the rejection of claims 16 – 28 under 35 U.S.C. § 102(b) and 103(a) have been fully considered and are persuasive in light of amendment.”) (emphasis added).

In view of the foregoing, it is plainly apparent that Nishimura et al. fails to disclose, or even suggest, all of the features set forth in claim 16. Accordingly, it is plainly apparent that Nishimura et al. fails to anticipate claim 16.

Claims 17 to 20, 23, and 24 depend from claim 16 and therefore include all of the features recited in claim 16. As such, it is respectfully submitted that Nishimura et al. does not anticipate these claims for at least the same reasons set forth above in support of the patentability of claim 16.

In view of all of the foregoing, reversal of the present rejection is respectfully requested.

B. Rejection of Claims 21, 22, and 25 to 28 Under 35 U.S.C. § 103(a)

Claims 21, 22, and 25 to 28 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Nishimura et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claims 21, 22, and 25 to 28 depend from claim 16 and therefore include all of the features recited in claim 16. As more fully set forth above, Nishimura et al. does not disclose or suggest all of the features recited in claim 16. As such, it is respectfully submitted that Nishimura et al. does not render unpatentable any of claims 21, 22, and 25 to 28.

In view of all of the foregoing, reversal of this rejection is respectfully requested.

8. CLAIMS APPENDIX

A “Claims Appendix” is attached hereto and appears on the two (2) pages numbered “Claims Appendix 1” to “Claims Appendix 2.”

9. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellants in the appeal. An “Evidence Appendix” is nevertheless attached hereto and appears on the one (1) page numbered “Evidence Appendix.”

10. RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2, above, “[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, ‘which may be related to, directly affect or be directly affected by or have a bearing on the Board’s decision in the pending appeal.’” As such, there no “decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]” to be submitted. A “Related Proceedings Appendix” is nevertheless attached hereto and appears on the one (1) page numbered “Related Proceedings Appendix.”

11. CONCLUSION

For at least the reasons indicated above, Appellants respectfully submit that the art of record does not disclose or suggest the subject matter as recited in the claims of the above-identified application. Accordingly, it is respectfully submitted that the subject matter as set forth in the claims of the present application is patentable.

In view of all of the foregoing, reversal of all of the rejections set forth in the Final Office Action is therefore respectfully requested.

Respectfully submitted,

Dated: August 21, 2008

By: /Gerard A. Messina/
Gerard A. Messina
Reg. No. 35,952

KENYON & KENYON LLP
One Broadway
New York, New York 10004
(212) 425-7200
CUSTOMER NO. 26646

CLAIMS APPENDIX

16. A layer system, comprising:

an etching layer, whereby the etching layer is a silicon layer; and

a passivation layer applied at least regionally to a surface of the silicon layer, wherein:

the passivation layer includes a first, at least largely, inorganic partial layer
and a second partial layer, and

the second partial layer is made of an organic compound.

17. The layer system as recited in Claim 16, wherein the organic compound contains a halogen.

18. The layer system as recited in Claim 16, wherein:

the organic compound includes a silane corresponding to one of an organic fluorine silane, an organic fluorochlorine silane, and a siloxane.

19. The layer system as recited in Claim 16, wherein the organic compound has the general formula $R_a-R_b-Si(X)_{3-n}-(R_c)_n$, R_a being a perfluorinated polyether or a perfluorinated alkyl group having 1 to 16 carbon atoms, especially 6 to 12 carbon atoms, R_b and R_c being an alkyl group, and X being a halogen, an acetoxy group or an alkoxy group, and n having a value of 0 to 2.

20. The layer system as recited in Claim 16, wherein the first partial layer is at least largely composed of an oxide layer including a silicon oxide.

21. The layer system as recited in Claim 16, wherein the first partial layer has a thickness of 1 nm to 100 nm.

22. The layer system as recited in Claim 16, wherein the first partial layer has a thickness of 1nm to 20 nm.

23. The layer system as recited in Claim 16, wherein the first partial layer is directly applied one of (a) to the silicon layer and (b) on a layer of silicon oxide situated on the silicon layer.

24. The layer system as recited in one Claim 16, wherein the second partial layer is a self-assembled monolayer.

25. The layer system as recited in Claim 16, wherein the second partial layer has a thickness of 0.5 nm to 30 nm.

26. The layer system as recited in Claim 16, wherein the second partial layer has a thickness of 5 nm to 20 nm.

27. The layer system as recited in Claim 16, wherein the passivation layer protects the silicon layer with respect to an etch attack by a gaseous halogen fluoride including one of ClF₃ and BrF₃.

28. The layer system as recited in Claim 16, wherein the passivation layer is free of micro-scale or nano-scale channels which are permeable for a gas including one of ClF₃, BrF₃ and a vapor.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§1.130, 1.131, or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellants in the appeal.

RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2 of this Appeal Brief, “[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, ‘which may be related to, directly affect or be directly affected by or have a bearing on the Board’s decision in the pending appeal.’” As such, there no “decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]” to be submitted.